

World Heritage Sites

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OGASAWARA ISLANDS JAPAN

The Ogasawara Islands are located in the North-Western Pacific Ocean roughly 1,000 km south of the main Japanese Archipelago. The serial property is comprised of five components within an extension of about 400 km from north to south and includes more than 30 islands, clustered within three island groups of the Ogasawara Archipelago: Mukojima, Chichijima and Hahajima, plus an additional three individual islands: Kita-iwoto and Minami-iwoto of the Kazan group and the isolated Nishinoshima Island. These islands rest along the Izu-Ogasawara Arc Trench System. The property totals 7,939 ha comprising a terrestrial area of 6,358 ha and a marine area of 1,581 ha. Today only two of the islands within the property are inhabited, Chichijima and Hahajima. The landscape is dominated by subtropical forest types and sclerophyllous shrublands surrounded by steep cliffs. There are more than 440 species of native vascular plants with exceptionally concentrated rates of endemism as high as 70% in woody plants. The islands are the habitat for more than 100 recorded native land snail species, over 90% of which are endemic to the islands. The islands serve as an outstanding example of the ongoing evolutionary processes in oceanic island ecosystems, as evidenced by the high levels of endemism; speciation through adaptive radiation; evolution of marine species into terrestrial species; and their importance for the scientific study of such processes.

COUNTRY

Japan

NAME

Ogasawara Islands

NATURAL WORLD HERITAGE SERIAL SITE

2011: Inscribed on the World Heritage List under natural criterion (ix).

STATEMENT OF OUTSTANDING UNIVERSAL VALUE

The UNESCO World Heritage Committee issued the following Statement of Outstanding Universal Value at the time of inscription:

Brief Synthesis

The Ogasawara Islands are located in the North-Western Pacific Ocean roughly 1,000 km south of the main Japanese Archipelago. The serial property is comprised of five components within an extension of about 400 km from north to south and includes more than 30 islands, clustered within three island groups of the Ogasawara Archipelago: Mukojima, Chichijima and Hahajima, plus an additional three individual islands: Kita-iwoto and Minami-iwoto of the Kazan group and the isolated Nishinoshima Island. These islands rest along the Izu-Ogasawara Arc Trench System. The property totals 7,939 ha comprising a terrestrial area of 6,358 ha and a marine area of 1,581 ha. Today only two of the islands within the property are inhabited, Chichijima and Hahajima. The landscape is dominated by subtropical forest types and sclerophyllous shrublands surrounded by steep cliffs. There are more than 440 species of native vascular plants with exceptionally concentrated rates of endemism as high as 70% in woody plants. The islands are the habitat for more than 100 recorded native land snail species, over 90% of which are endemic to the islands. The islands serve as an outstanding example of the ongoing evolutionary processes in oceanic island ecosystems, as evidenced by the high levels of endemism; speciation through adaptive radiation; evolution of marine species into terrestrial species; and their importance for the scientific study of such processes.

Criterion (ix): The property's ecosystems reflect a range of evolutionary processes illustrated through its rich assemblage of plant species from both a Southeast Asian and a Northeast Asian origin. There is also a very high percentage of endemic species in selected taxonomic groups, resulting from these evolutionary processes. Within

the flora it is an important centre for active, ongoing speciation. The Ogasawara Islands provide valuable evidence of evolutionary processes through their significant on-going ecological processes of adaptive radiation in the evolution of the land snail fauna as well as in their endemic plant species. The examples of fine-scale adaptive radiation between and sometimes within the different islands of the archipelago are central to the study and understanding of speciation and ecological diversification. This is further enhanced by the relatively low extinction rates in taxa such as the land snails. It is the combination of both the concentration of endemism and extent of adaptive radiation evident in the Ogasawara Islands which sets the property apart from other places illustrating evolutionary processes. When taking into account their small area, the Ogasawara Islands show exceptionally high levels of endemism in land snails and vascular plants.

Integrity

The boundaries of the serial property cover the key values of the property and are well designed. The zonation and the legal protection provide an appropriate framework, while the boundaries of Ogasawara National Park serve as a functional overall buffer zone. Marine protected areas are partly included, contributing to more effective management of the terrestrial-marine interface and thus integrity. Integrity issues are mostly related to external threats, most importantly invasive alien species. The effects of invasive alien species and historic logging have already altered many of the archipelago's habitats. Future invasions have the potential to compromise the very values the Ogasawara Islands have been recognized for and therefore need careful and continuous attention. Possible future air access, as well as increased visitation and corresponding development potentially have strong and even irreversible effects in a fragile island environment. Control of access to the islands and of alien invasive species, two in part overlapping issues, is of critical importance for the conservation of the archipelago.

Management and Protection Requirements

The majority of the property is state-owned and under the authority of various agencies. Some land is owned by Ogasawara Village with some other areas privately owned. The property contains five legally designated categories of protected area managed by three national Government agencies and is surrounded by the much larger Ogasawara National Park serving as a functional buffer zone. The property is protected through seven pieces of national legislation which overlap in jurisdiction and objectives specifying the mandate of the Ministry of the Environment, the Forestry Agency and the Cultural Agency. Any jurisdictional conflicts are resolved through an interagency Regional Liaison Committee structure.

The 2010 multi-agency Ogasawara Islands Management Plan and companion Ogasawara Islands Ecosystem Conservation Action Plan cover a wide area of 129,360 ha and include controls beyond the property such as ship navigation routes. The plans deal with critical issues such as access to the islands and control of alien invasive species. Management activities are detailed for the different island groups within the property with clear coordination mechanisms and monitoring plans prescribed. The plan is based on scientific knowledge and includes timetabled and prioritized actions.

The property benefits from strong links and dialogue between researchers, managers and community. Particularly commendable is the role of the Scientific Council and the approach to research which is adaptive and management-oriented. Local involvement and the maintenance of community benefits are crucial elements in the management of this remote archipelago.

IUCN MANAGEMENT CATEGORY

Unassigned

BIOGEOGRAPHICAL PROVINCE

Micronesian Province of the Oceanic Realm (5.2.13)

GEOGRAPHICAL LOCATION

The Ogasawara Islands are located in the western Pacific Ocean, to the north of the Tropic of Cancer and roughly 1,000 km south of the main Japanese Archipelago. The property is comprised of five components within an extension of about 400 km from north to south and includes more than 30 islands, clustered within three island groups of the Ogasawara Archipelago (Mukojima, Chichijima and Hahajima), plus two individual islands of the Kazan group (Kita-iwoto and Minami-iwoto) and the isolated Nishinoshima Island.

The geographical coordinates for the centre point are 25°59'5.32"N and 141°33'44.51" E, with outer boundaries of 24°13'28.87" - 27°44'41.76" N and 140°52'20.87" - 142°15' 8.15" E.

DATES AND HISTORY OF ESTABLISHMENT

1970: The Ogasawara Island Reconstruction Plan was announced, based on the Act on Special Measures for the Ogasawara Islands Reconstruction.

1972: More than 30 islands (except Iwoto, Okino-torishima, Minami-torishima and parts of Chichijima and Hahajima), together with their surrounding marine areas are designated as Ogasawara

National Park. Seven marine spots of exceptional scenic beauty are designated and protected as Marine Park.

1975: Minami-iwoto is independently designated the Minami-iwoto Wilderness Area under the Nature Conservation Law, at which time it was removed from Ogasawara National Park.

2003: The Ogasawara Islands are selected to be nominated as a World Natural Heritage Site.

2007: As a signatory to the Convention Concerning the Protection of the World Cultural and Natural Heritage, Japan inscribes the Ogasawara Islands on its tentative list for World Natural Heritage Sites.

2011: Inscribed on the World Heritage List.

AREA

The inscribed Ogasawara Islands property has an overall surface area of 7,939 ha (including a terrestrial area of 6,358 ha and a marine area of 1,581 ha). Residential areas and some other areas on inhabited Chichijima and Hahajima are excluded from the property. Although no buffer zone was specified in the original nomination, Japan subsequently confirmed that the much larger Ogasawara National Park (6,629 ha land and 121,380 ha sea) serves as a functional buffer zone to the property.

Area of the Ogasawara Islands property (including peripheral reefs)

Name	Area (ha)
Ogasawara Archipelago (Mukojima Island group 543 ha, Chichijima Island group 4,039 ha, Hahajima Island Group 2,415 ha)	6,997
Kazan Island Group	912
Nishino Island	30
Whole Ogasawara Islands	7,939

LAND TENURE

Most of the inscribed property is State owned and under the authority of various governmental agencies, including the Forestry Agency, the Ministry of Finance, the Ministry of the Environment (MoE) and the Tokyo Metropolitan Government (TMG). The Forestry Agency is in charge of the National Forests, roughly 80% of the terrestrial surface of the nominated area. In addition, some land is owned by Ogasawara Village with the remaining areas privately owned.

ALTITUDE

The highest elevations of the Chichijima Island Group, Hahajima Island Group and the Kazan Island Group are 326 m, 462 m and 916 m above sea level, respectively, whereas the Mukojima Island Group and Nishinoshima Island are flat and lower-lying.

PHYSICAL FEATURES

The Ogasawara Islands make up an oceanic island arc (part of the 1500 km long Izu-Ogasawara/Bonin Arc-Trench System) that formed along the eastern edge of the oceanic Philippine Sea Plate as a result of subduction of the Pacific Plate 48 million years ago. The landscape varies between the island groups and individual islands of this oceanic island archipelago. The islands in the Chichijima Island Group are all plateau-like in shape with gently rolling plains bounded by sea cliffs. The strata of the Chichijima Island Group are classified into four formations from bottom to top: the Maruberiwan Formation (boninite-series rocks such as pillow lava and arc tholeiitic volcanic rocks), Asahiya Formation (boninite-series rocks including dacite), Mikazuki Formation (including calcalkaline andesite and dacite) and Minamizaki Formation (a limestone stratum formed after the cessation of volcanic activity). The strata are exposed and can be observed at the sea cliffs. Islands of the Mukojima Island Group are flat and surrounded by sea cliffs. They are raised submarine volcanoes made up mainly of boninite, bronzite andesite pillow lava, pyroclastic rocks, and arc tholeiitic andesite that were erupted during the early stage of plate subduction. The Hahajima Island Group is characterised by precipitous ridges and tall sea cliffs. The volcanic rocks are mainly island-arc tholeiite and calc-alkaline andesite, with some undifferentiated basalt and dacite, but no boninite. After volcanic activity subsided, foraminifers (*Nummulites* spp.), calcareous algae, and other reef-building organisms were deposited near the Sekimon area and ultimately became limestone. The two islands from the Kazan Group are

mountainous with both islands formed from the summits of giant submarine stratovolcanos. The constituent rocks are highly alkaline tholeiitic or alkaline basalts. These young and discrete stratovolcano islands lack flat areas, with steep slopes making the islands virtually inaccessible. Nishinoshima Island is flat and triangular and located on the peak of a large submarine volcano which rises 3,000 metres from the sea floor. It is composed of volcanic products and beach deposits dating from late Pleistocene to present day, with volcanic eruptions and marine erosion constantly changing the shape of the island.

CLIMATE

The islands have a maritime, subtropical climate characterised by small annual and diurnal temperature ranges and high levels of relative humidity. The area is slightly affected by typhoons and has a mean annual precipitation of 1,276.7 mm (1971-2000). The mean annual temperature of Chichijima 1971-2000 is 23.0°C, with the hottest month in August (mean 27.6°C) and the coldest month in February (mean 17.7°C). There is a wide range of microclimates across and within the islands, with cloud belts developing on the top of taller islands such as Minami-iwoto.

VEGETATION

The archipelago is a mixed island biome dominated by subtropical forest types and sclerophyllous shrublands. On steep cliffs and windswept headlands the vegetation is reduced to grasses and herbs. The coast is also home to a tall forest of pantropical species. The climatic conditions on a number of the islands and the frequent presence of fog within the cloud belt also provide suitable conditions for many species of bryophytes, epiphytes and tree ferns.

Due to the location of the islands, the plant species reflect a mixture of origins with many species from subtropical Southeast Asia (such as *Schima mertensiana*, *Planchonella obovata*, *Elaeocarpus photiniaefolius*, *Rhaphiolepis indica* var. *umbellata*, *Distylium lepidotum*, *Syzygium buxifolium*, and *Ardisia sieboldii*), in addition to species reflecting a northern origin from the mainland of Japan (such as *Stachyurus praecox* var. *macrocarpus* and *Rubus nakaii*), as well as species from Oceania (including *Meterosideros boninensis* and *Santalum boninense*). These species with diverse origins are a characteristic feature of the property and have achieved unique speciation. Despite the islands being oceanic and of small size, there are many plant species and the proportion of endemic species is high. There are 441 documented taxa of native plants including 161 taxa of endemic vascular plants and 88 taxa of endemic woody plants. The islands are also an important area for threatened plants, containing 144 species from the Ministry of the Environment Red List.

The flora of the Ogasawara Islands demonstrate many interesting processes including: adaptive radiation and “parallel speciation” (including those in the genera *Pittosporum*, *Callicarpa*, *Boninia* and *Symplocos*); the evolution of dioecy (e.g. in *Wikstroemia pseudoretusa*); the development of woodiness in herbaceous plants (e.g. *Lobelia boninensis*); and the coevolution of plants and insects (such as pollination by fig wasps of endemic species in the genus *Ficus*).

FAUNA

The faunal composition of the islands is characteristic of isolated oceanic island systems. The numbers of native taxa are unusually skewed with some being underrepresented or absent altogether while others are disproportionately large in number. The only terrestrial native mammal species is the endemic, critically endangered Bonin flying fox *Pteropus pselaphon* (CR). Distribution of this species is confirmed on Chichijima, Hahajima, Kita-iwoto, Iwoto, and Minami-iwoto and may also inhabit Anijima and Mukojima islands. The number of bird species that have settled on the islands is limited compared with the avifauna of Japan, as the Ogasawara Islands are roughly 1,000 km from the nearest sizeable landmass. However, fourteen of the 195 recorded bird species are on the IUCN Red List and 22 species of native birds are known to breed on the islands. At present the Bonin honeyeater *Apalopteron familiare* (VU) is the only existing endemic landbird. Two species of terrestrial reptiles have been recorded on the islands: the endemic Ogasawara snake-eyed skink *Cryptoblepharus nigropunctatus* and the Micronesian gecko *Perochirus ateles*. There are 1380 insect species, 379 of which are endemic. The Ogasawara Islands further host 40 recorded species of freshwater fish, including an endemic species of the genus *Rhinogobius*. One of the most distinctive examples of adaptive radiation of the fauna is found within the land snails. There are 134 species of land snails of which 100 are endemic. Among soil invertebrates of interest are isopods of the genus *Ligia*, including *Ligia boninensis*, which (unlike most species of *Ligia*, which occur in marine environments) appears to maintain lower levels of internal salinity and to have adapted to inland environments.

In the ocean around the islands, 795 species of fish, 23 species of cetaceans (including the Endangered Sei whale *Balaenoptera borealis* (EN), Blue whale *B. musculus*, (EN), Fin whale *B. physalus* (EN) and North Pacific right whale *Eubalaena japonica* (EN) and 226 hermatypic coral species have been documented. The ocean surrounding the archipelago is known to provide excellent habitat for migratory cetaceans and turtles.

CONSERVATION VALUE

Despite their small size, the Ogasawara Islands offer a valuable record of the evolutionary processes of the earth, clearly demonstrating the processes of evolution in their flora and fauna including adaptive radiation, and contain a high level of endemism and high level of biological diversity in certain groups of species. For example, outstanding examples of speciation through adaptive radiation are seen among the land snails and various modes of speciation showing the characteristics of evolution on oceanic islands are seen in the plant species. The islands provide habitats for many endangered species of global significance and are particularly invaluable for the conservation of biodiversity in the northwest Pacific region.

Each component part of the Ogasawara Islands property is designated as Important Bird Area (IBA) by BirdLife International. In addition, the Ogasawara Archipelago is designated as an Endemic Bird Area (EBA) by BirdLife International, because it is the habitat of the endemic Bonin honeyeater and a subspecies of Japanese wood pigeon *Columba janthina nitens*, a restricted-range species.

The Ogasawara Islands provide an excellent example of the process whereby oceanic island arcs form and take shape over millions of years in response to subduction beneath an oceanic plate. Unlike most of the Izu-Ogasawara Arc which lies under deep ocean, terrestrial exposures of the geological strata and differentiated lava flows can be observed in detail on the Ogasawara Islands, representing the full chronological development of an oceanic island arc and providing an outstanding evolutionary record of how continental crust formed and grew on earth.

LOCAL HUMAN POPULATION

Human occupation of the islands is relatively recent with a small group of Westerners and Pacific Islanders settling on Chichijima in 1830. The islands were virtually abandoned during World War II and reoccupied only after 1968. Today only two of the islands within the nominated property are inhabited (Chichijima and Hahajima) with a combined residential population of 2,462 (as of 2009), and overall growth in the residential population is modest. Residential areas and surrounding small scale agricultural lands are excluded from the area of the nominated property.

VISITORS AND VISITOR FACILITIES

A modest number of around 17,000 tourists visit the islands for sightseeing purposes each year, with numbers limited by accessibility. More than half of the tourists to Ogasawara list the beauty of the natural environment as the reason for visiting, with 30% of tourists having visited at least once before. Because ferry liners only allow direct access to the inhabited Chichijima and Hahajima, visitation is chiefly limited to these two islands, on which a series of trails and recreation areas are maintained.

Eco-tours including whale watching, marine tours, field tours, battle site tours, birding tours and night tours are conducted by the >200 accredited tour guides providing visitor services on the islands. There are also eco-tours combined with volunteer programmes for vegetation restoration, including *Bischofia* removal on Hahajima and planting endemic species such as *Elaeocarpus photiniaefolius*.

Chichijima has the Ogasawara Visitor Centre, the Ogasawara Subtropical Branch of Tokyo Metropolitan Agricultural Experiment Station, the Ogasawara Fisheries Research Centre, and the Ogasawara Marine Centre, all of which tourists can visit freely. The Visitor Centre hosts exhibits, lectures, hands-on workshops and nature tours, with information on the formation and history of the islands and examples of seascapes and rare plants and animals.

The main centres for lodging are on Chichijima and Hahajima islands, which, as of 2008, had 54 and 15 lodging facilities respectively. Camping is prohibited by the Natural Parks Law and by Ogasawara Village ordinances; hence visitors are required to stay in the lodging facilities provided. There are also >50 eating and drinking establishments on Chichijima and Hahajima islands, outside the Ogasawara Islands property.

SCIENTIFIC RESEARCH AND FACILITIES

A multitude of scientific studies, research and long-term monitoring are conducted on the Ogasawara Islands. The MoE and Forestry Agency have set up monitoring sites and sampling plots throughout Japan, of which six stations for both surveys are situated on the Ogasawara Islands. The state of conservation of the islands is monitored by different agencies over different time periods, such as: measurement of daily weather conditions; annual surveys of population/distribution status of many endangered plants and animals; and forest surveys, tree censuses, and mammal/bird/insect surveys conducted every five years. The MoE, Forestry Agency and TMG each have study groups and committees dedicated to studies concerning protection and breeding of key species, vegetation monitoring and restoration, and eradication of invasive alien species (including feral goats). Local NGOs such as the Institute of Boninology conduct research work in cooperation with other academic institutions and government agencies. They are also active in involving local community groups and members in their work.

Under the endangered species conservation program, the TMG, the Koishikawa Botanical Gardens of the University of Tokyo, and other organisations commissioned by the MoE conduct a wide variety of projects. These include a current status survey and study of growth characteristics, re-introduction or transplantation of species to appropriate habitats, and the prevention of feeding damage by alien species such as feral goats and black rats. The Review Committee on the Conservation Program for the Endangered Plant Species of the Ogasawara Islands was established by the MoE to give advice and coordinate these projects.

Research into the present status of the Bonin flying fox (*Pteropus pselaphon*) is conducted by the Ogasawara Village supported by the Agency for Cultural Affairs and TMG, and a local non-profit organization (NPO). Current conservation measures include the monitoring of populations, measures against predation by feral cats, and measures to minimise agricultural damage caused by this species (such as the use of tangle-free bat-proof nets).

The Ogasawara Subtropical Branch of Tokyo Metropolitan Agricultural Experiment Station is run by the TMG, undertaking experimental research, holding training courses for farmers and promoting sustainable agriculture in Ogasawara. The Ogasawara Fisheries Centre is a research and teaching facility that places an emphasis on the conservation and management of marine resources and the development of artificial culture technologies. The Ogasawara Marine Centre (currently operated and managed by the NPO Everlasting Nature of Asia) has focused on research into Green turtles, Humpback whales, and other marine life. The Centre accepts volunteers, trainees, and interns, whose numbers now exceed 500 annually.

MANAGEMENT

The 2010 multi-agency Ogasawara Islands Management Plan and companion Ogasawara Islands Ecosystem Conservation Action Plan cover a wide area of 129,360 ha and include controls beyond the Ogasawara Islands property (such as ship navigation routes). The plans deal with critical issues such as access to the islands and control of invasive alien species. Management activities are detailed for the different island groups within the property with clear coordination mechanisms and monitoring plans prescribed. The plan is based on scientific knowledge and includes timetabled and prioritised actions.

Interagency cooperation is driven through a Regional Liaison Committee, which meets regularly, and the property benefits from strong links and dialogue between researchers, managers and the community, including through a Scientific Council.

The Ogasawara Islands property contains five legally designated categories of protected area managed by three national Government agencies: 1. Wilderness Area; 2. National Park; 3. National Wildlife Protection Areas (all Ministry of the Environment); 4. Forest Ecosystem Reserves (Forestry Agency); and 5. Natural Monuments (Cultural Agency). Various management functions are delegated to the TMG and Ogasawara Village Administration. The Ogasawara Islands are protected through seven pieces of national legislation which overlap in jurisdiction and objectives, including the Nature Conservation Law, the Wildlife Protection and Appropriate Hunting Law, the Law for the Protection of Cultural Properties, the Law for the Conservation of Endangered Species of Wild Fauna and Flora and the Invasive Alien Species Act. Despite the complex matrix of laws defining and affecting the property, they together provide for a complementary and generally harmonized suite of protection.

One indication of the successful application of protection measures on the Ogasawara Islands is the low extinction rate of land snails compared with populations on other Pacific Islands, due to preservation of their habitats. Minami-iwoto Island is also designated as a Restricted Entry Zone by the Nature Conservation Law and remains unaffected by human influence, leaving its natural environment untouched.

In order to promote tourism while conserving the rich natural environment, a number of voluntary rules have been developed and promoted, including the MoE 'Ten rules for the coexistence with nature: The Ogasawara Country Code' and guidelines for watching whales, sea turtles and the Bonin flying fox produced by the Ogasawara Village Tourist Association.

MANAGEMENT CONSTRAINTS

The Ogasawara Islands were once covered by dense subtropical evergreen broadleaved forests; however most of the forest has been cleared or seriously degraded over the last hundred years. The Ogasawara Islands have been and continue to be severely threatened by the human presence. The main causes for this are conversion of habitats and invasive alien species. Further concerns include possible future air access, increased tourism and development, and the expected consequences of climate change.

There are 22 recorded alien species of fauna on the islands including goats, cats, black rats, green anoles, pigs, the predatory flatworm, bullfrogs and cane toads, in addition to >300 species of invasive plants including those of the genus *Bischofia*, *Casuarina*, and *Leucacena*. There has been noteworthy progress made in the management of alien invasive species, with the Ogasawara Islands Management Plan adopting approaches ranging from control to mitigation to eradication. Management is based on sound scientific understanding and modification of best practices from Australia and New Zealand, involving collaboration between academic institutions, government agencies, NGOs and local communities.

Negative impacts from tourism are managed through a strict access control regime, with many sensitive areas off-limits to visitors or only accessible through guided tours. Of concern is establishment of air services to the islands through an airstrip on Chichijima Island, although residents appear to favour a small scale solution for residential and emergency use.

The Ogasawara Islands may not be subject to the same level of impacts of predicted sea level rise as other low lying island systems and atolls. Nonetheless, there are likely impacts of climate change, such as on species compositions, ranges, seasonal cycles and habitat preferences. In addition, a higher frequency and intensity of natural disasters such as landslides, typhoons and droughts could impact the islands in future.

The multi-agency management presence on the Ogasawara Islands (including three types of rangers: TMG, MoE and Forestry Agency) results in somewhat complex procedures for law enforcement. Currently rangers from one particular agency aware of infringements are required to report these to the relevant authority and then these incidents, if serious enough to warrant further action, are reported to the police

COMPARISON WITH SIMILAR SITES

Several islands or portions of islands are on the World Heritage List. The Ogasawara Islands are inscribed on the World Heritage List under criterion (ix) as an outstanding example of the ongoing evolutionary processes in oceanic island ecosystems, as evidenced by the high levels of endemism; speciation through adaptive radiation; evolution of marine species into terrestrial species; and for their importance for the scientific study of such processes. The high degree of endemism is striking and is best illustrated in relation to vascular plants and land snails. Of the 82 extant species of native land snail, 93% are endemic, thus the Ogasawara Islands have a higher level of land snail endemism than the Madeira Archipelago (Portugal, 88%) and the Canary Islands (Spain, 81%); however, their level of endemism does not reach that of the Hawaiian Islands (United States of America, 97%), Galapagos Islands (Ecuador, 96%) and Socotra Archipelago (Yemen, 95%).

Several World Heritage properties are recognised for the demonstration of evolutionary processes such as adaptive radiation and speciation, in particular the Galapagos Islands (Ecuador), East Rennell (Solomon Islands) and Aldabra Atoll (Seychelles). The Kermadec Islands, on New Zealand's Tentative List, are also known for comparable values. Although not as well known as the Galapagos Islands or the

Hawaiian Islands, the Ogasawara Islands provide evidence for the different stages of the evolution of endemic species on oceanic islands: long-distance migration, establishment, enlargement and adaptive radiation and diversification. Whilst the degree of speciation and differentiation in the plants and animals of the Galapagos is not matched in the Ogasawara Islands, the inscribed property illustrates a higher concentration of endemism and examples of adaptive radiation in a significantly smaller area. Thus, the Ogasawara Islands complement the observable evolutionary processes in the Galapagos with many examples at a different spatial scale and showing much earlier stages of evolutionary processes.

Whilst the Ogasawara Islands were not inscribed on the World Heritage List for their levels of species diversity, the property is an Endemic Bird Area (EBA). However, similarly sized islands and island groups such as Lord Howe Island Group, Macquarie Island (both Australia) or Gough and Inaccessible Islands (U.K.) contain a larger number of bird species. The property is located within the Japan biodiversity hotspot, a global conservation priority well covered by existing World Heritage properties. These are Yakushima, Shirakami-Sanchi and Shiretoko, all of which have a higher plant and vertebrate diversity than the Ogasawaras, except for the number of recorded bird species. Several island systems boast considerably higher numbers of endemic species and higher ratios of endemic to native species, such as the Galapagos, Lord Howe and Hawaii Islands in the Pacific and Socotra Island (Yemen) in the Indian Ocean.

STAFF

There are roughly 50 staff located both in the archipelago and Tokyo, with staff numbers having increased by 36% 2005-2010. Offices of the MoE, the Forestry Agency and TMG are staffed with employees well-versed in nature protection systems and conservation management techniques and the Ogasawara Village Office is staffed with specialists who provide accurate information on conservation and management to local residents.

BUDGET

Management of the property is undertaken by the various administrative authorities with total funding almost doubling 2005-2010 to USD 11.6 million, spent annually on conservation interventions. In 2009, the Ministry of the Environment (MoE) and the Tokyo Metropolitan Government (TMG), had an annual budget of about 375,000,000 yen (USD 4.17 million) for management of the Wilderness Area, National Park, and National Wildlife Protection Area (sharing management of the National Park with the TMG); the Forestry Agency had an annual budget of about 157,000,000 yen (USD 1.74 million) for management of the Forest Ecosystem Reserve (which occupies about 80% of the property and surrounding national forests); the TMG had an annual budget of about 503,638,000 yen (USD 5.6 million) to manage the National Park in conjunction with the MoE; and Village funds of about 6,285,000 yen (USD 70 thousand) were available from the local administrative government of Ogasawara Village to undertake campaigns to raise awareness amongst local residents of the importance and value of the natural environment and the need to conserve and live in harmony with it.

Business planning to diversify and secure future financing is not yet being undertaken on the Ogasawara Islands due to the significant levels of Government funding for current management. However, there is scope to undertake business planning on community-based activities (such as guided tours) to enhance local income and conservation funding.

LOCAL ADDRESSES

Ogasawara Ranger Office for Nature Conservation, Ministry of the Environment, 55-5 Nishi-machi, Chichijima, Ogasawara village, Tokyo 100-2101.

Ogasawara Islands forest ecosystem conservation, Kanto Regional Forest Office, Forestry Agency, Higashi-machi, Chichijima, Ogasawara village, Tokyo 100-2101.

National Forest Division, Ogasawara General Office, Ministry of Land, Infrastructure, Transport & Tourism, Higashi-machi, Chichijima, Ogasawara village, Tokyo 100-2101.

Ogasawara Islands Branch Office, Tokyo Metropolitan Government, Nishi-machi, Chichijima, Ogasawara village, Tokyo 100-2101.

Web address: <http://www.soumu.metro.tokyo.jp/07ogasawara/index.htm>

REFERENCES

The principal sources for the above information were the original World Heritage nomination with additional information submitted by Japan in November 2010. IUCN's evaluation report, and Decision 35 COM 8B.11 of the UNESCO World Heritage Committee.

DATE

December 2011, January 2012.